

IN THE CLAIMS

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-20 (cancelled)

21. (Currently Amended) A vacuum pick and place device comprising:

~~a pick and place nozzle which includes a lifting portion having an air suction port and sucks in air from the air suction port to lift a part to said lifting portion;~~
~~a vacuum supply unit which supplies a vacuum for suction to said pick and place nozzle;~~
~~and a pick and place confirming sensor which measures a flow rate of air sucked in from the air suction port, and outputs an electrical signal indicating presence or absence of a part lifted to said lifting portion on the basis of the measured flow rate.~~

a plurality of pick and place nozzles, providing a lifting portion opened with an air suction port and an air suction hole where a flow rate of air sucked in from said air suction port becomes a sonic speed by a vacuum pressure, for lifting individual parts at said lifting portion by sucking in air through said air suction hole from said air suction port,

a plurality of air suction passages connected to each of said plurality of pick and place nozzles,

a pipe to which said plurality of air suction passages is connected in parallel,
a vacuum supply unit which is connected to said pipe, and, which supplies a vacuum through said pipe and said plurality of air suction passages to each of said plurality of pick and

place nozzles with which a pressure at said air suction port is at least approximately twice a pressure at a downstream end of said air suction hole, and

a plurality of pick and place confirming sensors which are provided in each of said plurality of air suction passages, and, which measure a flow rate of air sucked in from said air suction port of said pick and place nozzle and output an electrical signal indicating the presence or absence of a part lifted to said lifting portion on the basis of the measured flow rate.

22. (Currently Amended) A vacuum pick and place device according to claim 21, wherein said pick and place confirming sensor includes

a base arranged in a gas channel,

a heater formed as a thin film on a surface of said base,

a plurality of temperature sensors formed as thin films on said surface of said base ~~and~~,

measuring means for measuring a mass flow rate on the basis of a temperature

distribution in the vicinity of said heater which is measured by said temperature sensors, and

detection means for outputting an electrical signal indicating the presence or absence of a part lifted to said lifting portion on the basis of an output from said measurement
means, measuring a gas flow rate on the basis of a temperature distribution in the vicinity of said
heater which is measured by said temperature sensors.

23. (Currently Amended) A vacuum pick and place device according to claim 21, further comprising:

a plurality of valves which are provided in each of said plurality of air suction
passages, and, which control suction of air from said pick and place nozzle using the

~~vacuum, a valve which controls suction of air from said pick and place nozzle using the vacuum, and an air suction passage which connects said pick and place nozzle, pick and place confirming sensor, valve, and vacuum supply unit to each other.~~

24. (Currently Amended) A vacuum pick and place device according to claim 23, wherein said pick and place confirming sensor includes a flow sensor which measures a mass ~~detects a change in~~ flow rate of air measured in said air suction passage between said valve and said pick and place nozzle, and detection means for outputting an electrical signal indicating the presence or absence of a part lifted to said lifting portion on the basis of an output from said flow sensor.

25. (Previously Presented) A vacuum pick and place device according to claim 24, wherein said flow sensor detects a change in flow rate of air measured in a portion of said air suction passage which is in the vicinity of said pick and place nozzle.

26 - 28 (Cancelled)

29. (Currently Amended) A vacuum pick and place device according to claim 2127, wherein said pick and place nozzle ~~wherein further includes an air suction hole which has a channel sectional area with such a size that a flow speed of air sucked in through the air suction port by the vacuum becomes a sonic speed and in which an opening area of the air suction port changes in accordance with a state of a part lifted to said lifting portion.~~

30. (Currently Amended) A vacuum pick and place device according to claim 21, wherein
~~said pick and place nozzle further includes an air suction hole which opens to said the air~~
~~suction port, and leads the air sucked in from said air suction port to a nozzle inner chamber of~~
~~said pick and place nozzle in communication with said air suction passage guides air, sucked in~~
~~through the air suction port, to a nozzle inner chamber of said pick and place nozzle connected to~~
~~and in contact with said vacuum supply unit, and~~
~~— said vacuum supply unit generates a vacuum with which a pressure at an upstream end of~~
~~the air suction hole is at least approximately twice a pressure at a downstream end.~~

31 – 40 (Cancelled)